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ABSTRACT

This book of posttests is designed to accompany the Engine Tune-Up Service Student Guide for Unit 1, Battery and Cranking System. Focus of the posttests is the testing of the battery and cranking system. Four multiple choice posttests are provided, one for each of the performance objectives contained in the unit. (No answer keys are provided.) (YLB)

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ENGINE TUNE-UP SERVICE

Unit 1: Battery and Cranking System

Posttests

Automotive Mechanics Curriculum

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POSTTEST
P.O. 1

Directions: Read the first question carefully. After selecting your answer, record the answer on your answer sheet in the space provided.

Next, turn to the question listed in parentheses at the end of your answer. For example, if your choice says, "go to #14," you would answer question 14 next.

Each time you answer a question, be sure to write down on your answer sheet ***both*** the question number and the letter of your answer. Continue working through the test until you reach the end.

You will be jumping from question to question, and will not have to answer more than 30 questions in all.

DO NOT MARK ON THIS TEST.

POSTTEST
P.O. 1

1. **Situation:** You work as a mechanic for Ralph's Garage. One morning at about 8:30, a 1971 Chevrolet pulls in the driveway. The owner gets out of the car, walks up to you, and says, "The battery is low in my car—I just barely got the engine to turn over this morning."

   What is the first thing you should do?

   a. Check the specific gravity of the battery (go to #27)
   b. Try to crank the engine (go to #60)
   c. Remove the battery from the car and charge it (go to #7)
   d. Visually inspect the battery exterior and cables (go to #14)
   e. Show the owner your new batteries (go to #18)
   f. Make a 3-minute charge test (go to #4)

2. The battery is now filled with fresh electrolyte. You should next:

   a. Prepare the battery for fast charging (go to#67)
   b. Prepare the battery for slow charging (go to #35)
   c. Install the battery in the car (go to #74)
   d. Measure the voltage across the terminals (go to #90)

3. The charger does not have a voltage scale. You can find the proper charging rate by looking in the:

   a. Technical service manual (go to #15)
   b. Charger manufacturer's instructions (go to #15)
   c. Automobile owner's manual (go to #15)
   d. Automobile manufacturer's shop manual (go to #15)

4. What equipment will you need for the 3-minute charge test?

   a. Ammeter and voltmeter (go to #91)
   b. Variable-rate charger and voltmeter (go to #91)
   c. Variable-rate charger and ammeter (go to #91)

5. The electrolyte temperature is 60° F. You should now:

   a. Check the specific gravity (go to #28)
   b. Check the electrolyte level (go to #28)
   c. Stick a screwdriver into each cell and see whether it comes out wet (go to #28)

6. What tools should you use to remove the battery terminal clamps?

   a. Box wrench, spreader, and hammer (go to #80)
   b. Pliers, screwdriver, and hammer (go to #80)
   c. Box wrench and clamp puller (go to #80)
   d. Battery terminal brush and electrolyte filler (go to #80)

7. You are ready to remove the battery for charging. You should now:

   a. Select the proper eye protection (go to #41)
   b. Remove the battery vent cell caps (go to #10)
   c. Lift the battery out of the car (go to #64)
   d. Place a fender cover on the car (go to #41)

8. The battery is filled with electrolyte and is ready for charging. The battery ampere-hour rating is 60. What charging rate should you use?
   a. 180 amps (go to #44)
   b. 60 amps (go to #44)
   c. 42 amps (go to #44)
   d. 4.2 amps (go to #44)

9. Within five minutes, the battery electrolyte violently spews out of the vent caps. What do you do?
   a. Reduce the charging rate (go to #15)
   b. Replace the battery because it is bad (go to #32)
   c. Remove the vent caps and continue charging (go to #15)

10. The battery cell vent caps are now off. Now you should:
   a. Check the electrolyte temperature (go to #5)
   b. Check the electrolyte level (go to #79)
   c. Store the vent caps in a safe place (go to #87)
   d. Remove the hold-down brackets and clamps (go to #87)

11. The hammer goes through the case, causing electrolyte to gush out. What should you do?
   a. Rinse the area with plenty of water (go to #37)
   b. Blow the electrolyte out of engine compartment with compressed air (go to #37)
   c. Use a Class-B fire extinguisher to spray on the electrolyte (go to #37)
   d. Disconnect the ground terminal clamp on the battery (go to #37)

12. You bring the high-discharge tester over to the battery. You should now:
   a. Check the electrolyte specific gravity (go to #52)
   b. Attach the tester leads to the battery in the proper sequence (go to #80)
   c. Remove the battery cable clamps (go to #6)

13. If electrolyte gets on your skin, you should:
   a. Drink a glass of milk or water (go to #94)
   b. Pour water and baking soda on your skin (go to #94)
   c. Wipe it off with a shop rag (go to #94)
   d. Quickly pour some vinegar on your skin (go to #94)

14. The battery case is a little dirty, but otherwise it's okay. The clamps are tight, and the cables are in good condition. You should now:
   a. Check the specific gravity of the battery (go to #27)
   b. Try to crank the engine (go to #84)
   c. Remove the battery from the car and charge it (go to #7)
   d. Make a high-discharge test (go to #12)
   e. Show the owner your new batteries (go to #18)

15. When should you stop charging the battery?
   a. When the specific gravity of the cells stabilizes for three hours (go to #26)
   b. When the electrolyte temperature falls below 60° F. (go to #26)
   c. When the battery charger temperature reaches 125° F. (go to #26)
   d. When the electrolyte temperature reaches 125° F. (go to #26)

16. To clean the battery while it is in the car, you need eye protection, gloves, a wire brush, and:

a. Soda water and scouring powder (go to #70)
b. Water and baking soda (go to #70)
c. Lime water and a toothbrush (go to #70)
d. Fresh electrolyte and petroleum jelly (go to #70)

17. The engine cranks normally and starts. You should now:

a. Call the customer and tell him his car is ready (go to #97)
b. Make a high-discharge test (go to #97)
c. Check the specific gravity (go to #97)

18. The car owner mutters something about "rip-off mechanics" and asks you to "at least test the thing." You should now:

a. Make a 3-minute charge test (go to #91)
b. Check the specific gravity of the battery (go to #40)
c. Make a high-discharge test (go to #12)

19. The test results in a battery voltage reading of 12.2 v. You should now:

a. Prepare the battery for charging (go to #66)
b. Clean the battery and leave it in the car (go to #16)
c. Check the specific gravity of the battery (go to #63)
d. Replace the battery because it is bad (go to #8)

20. The battery electrolyte quickly heats up to 125° F. What do you do now?

a. Reduce the charging rate (go to #15)
b. Stop charging the battery (go to #15)
c. Continue charging the battery (go to #15)

21. When disposing of a used electrolyte container, you should:

a. Save it for storing any excess electrolyte you may have (go to #2)
b. Burn the container immediately (go to #2)
c. Rinse the container thoroughly with water and throw it away (go to #2)

22. You obtain a reading of 48 amps. You should now:

a. Prepare the battery for charging (go to #46)
b. Repeat the test, using a voltmeter across the battery terminals (go to #46)
c. Repeat the test, using a voltmeter from the positive terminal to different ground points (go to #46)
d. Replace the battery because it is bad (go to #21)

23. The high-discharge tester has a load limit of 500 amps. You should now:

a. Make the test using a 500-amp load (go to #96)
b. Check the specific gravity (go to #76)
c. Consult the tester manufacturer's instructions (go to #29)

24. The manufacturer's instructions don't mention R & R batteries. Now what should you do?

a. Tap the base of the battery lightly with a brass hammer to loosen corrosion buildup (go to #86)
b. Remove the hold-down bracket and cable clamps (go to #58)
c. Use a screwdriver to pry the battery free from the car (go to #92)
d. Use a wrecking bar to pry the battery free from the car (go to #92)

25. The electrolyte is at the proper level. You should now:

a. Call the customer and tell him his car is ready (go to #97)
b. Make an operational test of the battery to be sure the engine will crank (go to #97)
c. Make a high-discharge test (go to #97)
d. Make a 3-minute charge test (go to #97)

26. The battery is now fully charged. Your next step is to:

a. Install the battery in the car, using a strap or carrier for lifting (go to #31)
b. Remove the vent caps and check the electrolyte level (go to #25)
c. Make a high-discharge test (go to #55)
d. Clean the battery case (go to #45)

27. The cell readings at 60° F. are: 1.220, 1.210, 1.220, 1.240, 1.240, 1.230. You should next:

a. Replace the battery because it will not hold a charge (go to #39)
b. Make a 3-minute charge test (go to #88)
c. Charge the battery (go to #35)
d. Check the electrolyte level (go to #79)
e. Find the manufacturer's specifications for cold-cranking rating (go to #62)

28. What should you fill the battery with if the electrolyte is low?

a. Fresh water (go to #58)
b. Fresh electrolyte (go to #58)
c. Distilled water (go to #58)
d. Spring or mineral water (go to #58)

29. The tester manufacturer's instructions specify a load of three times the battery ampere hour rating. The battery to be tested has an ampere hour rating of 50. You should now:

a. Check the battery specific gravity (go to #63)
b. Make a high-discharge test with a 150-amp load (go to #47)
c. Make a high-discharge test with a 50-amp load (go to #19)

30. You want the battery to be fully charged. What method should you select?

a. Slow charge (go to #35)
b. Fast charge (go to #35)

31. The battery is now in the car and is properly connected. You should now:

a. Call the customer and tell him his car is ready (go to #97)
b. Make an operational test of the battery to be sure the engine will crank (go to #97)
c. Make a high-discharge test (go to #97)
d. Make a 3-minute charge test (go to #97)

32. The only new batteries you have are the dry-charged variety. This means that you must:

a. Make a 3-minute charge test after getting a battery off the shelf (go to #81)
b. Add electrolyte to each cell of the battery (go to #38)
c. Install the battery in the car (go to #74)

33. The cell readings at 60° F. are: 1.220, 1.210, 1.220, 1.240, 1.240, 1.230. You should:

a. Replace the battery because it will not hold a charge (go to #32)
b. Check the electrolyte level (go to #79)
c. Make a 3-minute charge test (go to #88)

34. How should you check for battery drain?

a. Turn the ignition switch on and look for the "Battery" light to come on (go to #77)
b. Use a voltmeter across the battery terminals (go to #36)
c. Use an ammeter across the battery terminals (go to #22)
d. Use a voltmeter from the positive terminal to different ground points (go to #95)

35. What tools should you use to remove the battery terminal clamps?

a. Battery terminal brush and electrolyte filler (go to #46)
b. Pliers, screwdriver, and hammer (go to #46)
c. Box wrench, clamp spreader, and hammer (go to #46)
d. Box wrench and clamp puller (go to #46)

36. You obtain a voltage reading of 12 v. Your next step is to:

a. Prepare the battery for charging (go to #46)
b. Repeat the test, measuring from the positive terminal to different ground points (go to #46)
c. Repeat the test using an ammeter (go to #46)
d. Replace the battery because it is bad (go to #32)

37. You must now finish removing the cable clamps and hold-down brackets. What do you do first?

a. Select the proper eye protection, gloves, and apron (go to #13)
b. Remove the cable clamps (go to #13)
c. Remove the hold-down brackets (go to #13)
d. Remove the vent caps and add clean water to the battery (go to #13)

38. If some electrolyte gets on your skin, you should:

a. Drink a glass of milk or water (go to #21)
b. Pour water and baking soda on your skin (go to #21)
c. Wipe it off with a shop rag (go to #21)
d. Quickly pour some vinegar on your skin (go to #21)

39. How can you determine the proper replacement battery for the car?

a. Check the technical service manual (go to #32)
b. Check the manufacturer's shop manual (go to #32)
c. Check the automobile owner's manual (go to #32)
d. Look on the old battery for the rating (go to #32)

40. The cell readings at 60° F. are: 1.220, 1.210, 1.220, 1.240, 1.240, 1.230. You should:

a. Replace the battery because it will not hold a charge (go to #32)
b. Make a 3-minute charge test (go to #88)
c. Check the electrolyte level (go to #79)
d. Find the manufacturer's specifications for cold-cranking rating (go to #54)

41. Your next step is to:

a. Remove the battery hold-down brackets (go to #87)
b. Remove the cable clamps (go to #87)
c. Check for battery drain (go to #34)
d. Remove the battery vent caps (go to #56)

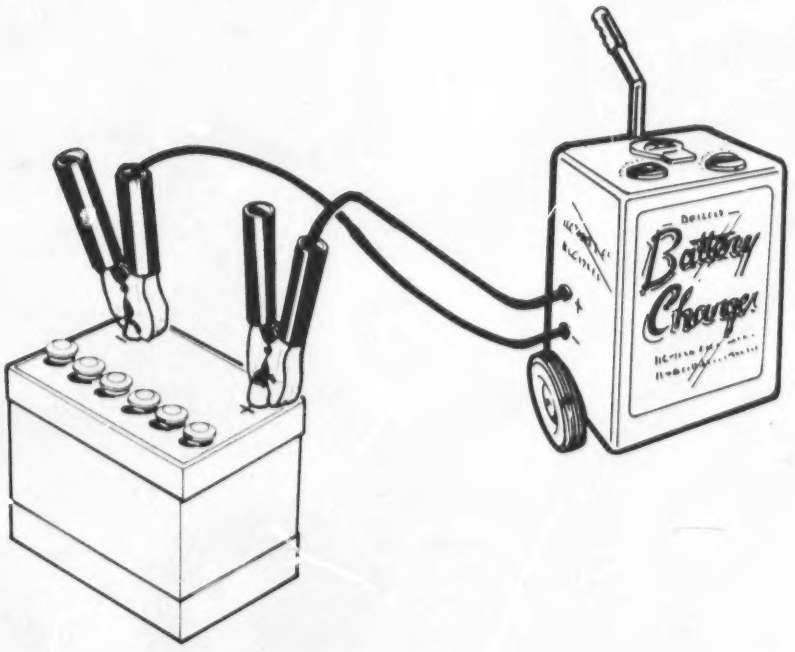
42. The high-discharge tester has a load limit of only 500 amps, but the battery wattage rating is 1200. You should:

a. Make the test using a 500-amp load (go to #96)
b. Consult the tester manufacturer's instructions (go to #29)
c. Check the specific gravity of the battery (go to #76)

43. You are ready to hook up the charger and turn it on. What hookup arrangement do you use?

a. (go to #15)
b. (go to #73)
c. (go to #82)

a.



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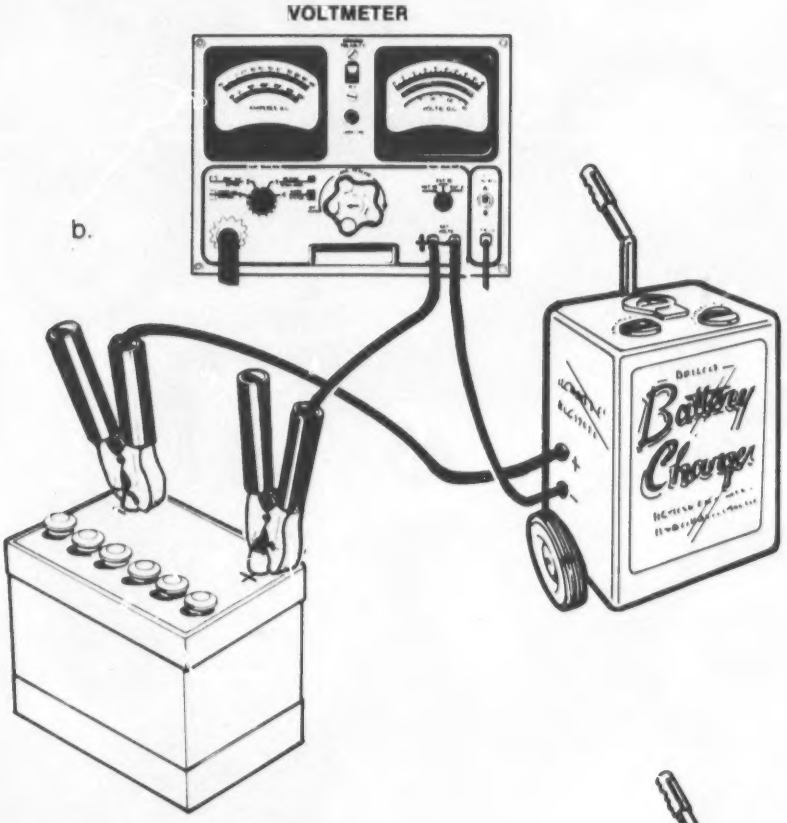

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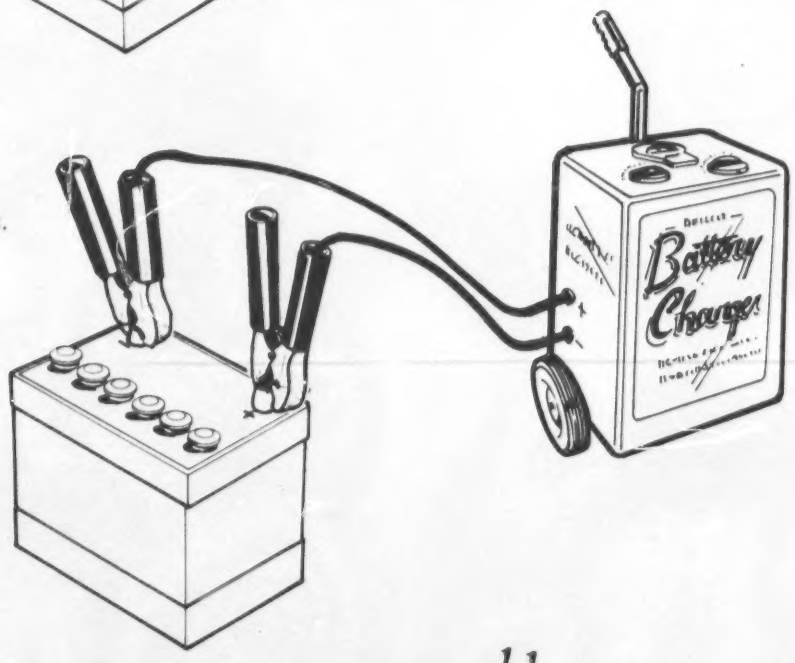

11

44. The battery is now fully charged. Your next step is to:

a. Make a high-discharge test (go to #53)
b. Attach the battery strap or carrier to the battery and carry it to the car (go to #53)
c. Remove the vent caps, lift the battery, and carry it to the car (go to #53)

45. The battery case is clean and dry. Now you should:

a. Make a 3-minute charge test (go to #97)
b. Call the customer and tell him his car is ready (go to #97)
c. Make an operational test of the battery to be sure the engine will crank (go to #97)
d. Make a high-discharge test (go to #97)

46. What should you do before you hook up the battery charger?

a. Check the electrolyte level (go to #58)
b. Clean the battery case and terminals (go to #58)
c. Remove the vent caps from the battery (go to #58)
d. Check the electrolyte temperature (go to #58)

47. The test results show a battery voltage reading of 9.6 v. You should now:

a. Prepare the battery for charging (go to #41)
b. Replace the battery because it is bad (go to #8)
c. Clean the battery and leave it in the car (go to #16)
d. Check the battery specific gravity (go to #63)

48. The battery case is a little dirty, but otherwise it's okay. The clamps are tight, and the cables are in good condition. You should now:

a. Check the specific gravity of the battery (go to #33)
b. Remove the battery from the car and charge it (go to #87)
c. Make a high-discharge test (go to #80)
d. Show the owner your new batteries (go to #39)

49. What tools should you use to tighten a nut-and-bolt terminal clamp?

a. Battery cable pliers or box-end wrench (go to #59)
b. Battery clamp or jaw puller (go to #59)
c. Battery cable-clamp spreader (go to #59)
d. Wire brush or battery terminal cleaner (go to #59)

50. No battery drain is detected. You should now:

a. Remove the battery for charging (go to #58)
b. Repeat the drain check, using the ammeter across the battery terminals (go to #58)
c. Repeat drain check, using the voltmeter across the battery terminals (go to #58)
d. Replace the battery because it is bad (go to #58)

51. When you are ready to charge a battery, what battery rating should you be concerned about?

a. Cold-cranking rating (go to #89)
b. Voltage rating (go to #89)
c. Ampere hour rating (go to #89)
d. Reserve capacity rating (go to #89)

52. The cell readings at 60° F. are: 1.220, 1.210, 1.220, 1.240, 1.240, 1.230. You should next:

a. Replace the battery because it will not hold a charge (go to #32)
b. Attach the high-discharge tester leads to the battery in the proper sequence (go to #80)
c. Prepare the battery for charging (go to #87)

53. The old battery has been removed. The new battery is okay and has been placed in the car. After tightening the hold-down brackets, you should:

a. Make a battery drain test, and then connect both cable clamps (go to #49)
b. Attach the ground cable clamp to the negative terminal and tighten it, make a battery drain test, and then attach the positive cable clamp (go to #49)
c. Attach the positive cable clamp to the positive terminal and tighten it, make a battery drain test, and then attach the ground cable clamp (go to #49)

54. Since 12 volts multiplied by 60 degrees equals 720, which is almost twice the cold-cranking rating of 380 amperes, you should now:

a. Stop. The battery has plenty of charge (go to #16)
b. Replace the battery (go to #32)
c. Make a 3-minute charge test (go to #88)
d. Prepare the battery for charging (go to #35)

55. The voltage after the test is 11 v. You should now:

a. Make a high-discharge test (go to #97)
b. Call the customer and tell him his car is ready (go to #97)
c. Make a 3-minute charge test (go to #97)
d. Make an operational test of the battery to be sure the engine will crank (go to #97)

56. Now that the vent caps are off, you should:

a. Prepare the battery for charging (go to #35)
b. Check the specific gravity of the battery (go to #35)
c. Check the electrolyte level in the cells (go to #35)
d. Store the vent caps in a safe place (go to #35)

57. The technical service manual gives no instructions for an R & R battery. What should you do now?

a. Use a screwdriver to pry the battery free from the car (go to #92)
b. Use a wrecking bar to pry the battery free from the car (go to #92)
c. Remove the hold-down brackets and cable clamps (go to #58)
d. Tap the base of the battery lightly with a brass hammer to loosen corrosion buildup (go to #86)

58. The electrolyte levels are low. You should now:

a. Replace the vent caps and prepare the charger (go to #66)
b. Check the electrolyte temperature (go to #66)
c. Clean the battery case and terminals (go to #66)
d. Use a battery filler to fill the cells with water to the proper level (go to #66)
e. Use fresh electrolyte to fill the cells to the proper level (go to #66)

59. The battery is now in car and is properly connected. You should now:

a. Call the customer and tell him his car is ready (go to #17)
b. Make an operational test of the battery to be sure the engine will crank (go to #17)
c. Make a 3-minute charge test (go to #17)

60. The engine cranks very slowly and then starts. You should now:

a. Perform a high-discharge test (go to #93)
b. Check the battery specific gravity (go to #27)
c. Replace the battery because it is bad (go to #18)
d. Visually inspect the battery exterior and cables (go to #48)

61. Another new battery is obtained, and the 3-minute charge test yields 0.0 v. You should now:

a. Install the battery in the car (go to #74)
b. Add electrolyte to the cells (go to #38)
c. Call the owner and tell him his car is ready (go to #97)

62. The manufacturer's specifications are 380 amperes. Your next step is to:

a. Take the total battery voltage and multiply it by the temperature; then compare the result to the specifications (go to #54)
b. Prepare the battery for a 3-minute charge test (go to #88)
c. Replace the battery because of low cold-cranking specifications (go to #32)

63. The cell readings at 60° F. are: 1.220, 1.210, 1.220, 1.240, 1.240, 1.230. You should now:

a. Prepare the battery for charging (go to #70)
b. Clean the battery and leave it in car (go to #16)
c. Replace the battery because of low cold-cranking specifications (go to #32)

64. You are ready to remove the battery. You should now:

a. Check the ampere hour rating and lift out the battery (go to #33)
b. Remove the vent caps and lift out the battery (go to #83)
c. Place a fender cover on the car and lift out the battery (go to #83)
d. Remove the terminal clamps (go to #35)

65. The test results show battery voltage of 14.5 v. What do you do now?

a. Replace the battery because it is bad (go to #32)
b. Prepare the battery for charging (go to #35)
c. Make a specific gravity check (go to #76)

66. Before charging the battery, you decide to clean the battery. What should you use?

a. Baking soda, water, terminal cleaner tools, goggles, and gloves (go to #70)
b. Vinegar, water, wire brush, and air gun for drying (go to #70)
c. Warm acid solution, eye protection, and chisel (go to #70)
d. Toothbrush, scouring powder, and soda water for rinsing (go to #70)

67. The battery has a 60-ampere hour rating. What charging rate should you use for the fast charge?

a. Three times the ampere hour rating (go to #44)
b. Half the ampere hour rating (go to #44)
c. As much as the battery will take without boiling the electrolyte (go to #44)
d. Whatever the charging unit manufacturer recommends (go to #44)

68. Now that the battery cell vent caps are off, you should:

a. Check the electrolyte level in cells (go to #79)
b. Remove the hold-down brackets and cable clamps (go to #35)
c. Store the vent caps in a safe place (go to #79)
d. Check the electrolyte temperature (go to #5)

69. The specific gravity readings are: 1.240, 1.240, 1.240, 1.240, 1.240, 1.240. Your next step is to:

a. Install the battery in the car (go to #74)
b. Prepare the battery for slow charging (go to #8)
c. Prepare the battery for fast charging (go to #67)

70. You want the battery to be fully charged. What do you now do?

a. Turn on the charger and attach the cables from the charging unit to the battery (go to #78)
b. Set the charger for a slow-charging rate (go to #78)
c. Remove the vent caps from the battery (go to #78)
d. Set the charger for a fast-charging rate (go to #78)

71. While trying to remove the positive cable clamp, you accidently touch your wrench to the car's wheel well and sparks fly. You should now:

a. Remove the negative cable clamp before proceeding (go to #46)
b. Check the car's ignition switch to be sure it is turned off (go to #46)
c. Continue and carefully remove the positive cable clamp (go to #46)

72. The results of the high-discharge test show a battery voltage of 8.4 v. What do you do now?

a. Replace the battery because it is bad (go to #32)
b. Prepare the battery for charging (go to #35)
c. Make a 3-minute charge test (go to #36)
d. Check the battery specific gravity (go to #76)

73. After an hour, nothing has happened. You can find the proper hookup arrangement by checking the:

a. Automobile owner's manual (go to #26)
b. Automobile manufacturer's shop manual (go to #26)
c. Technical service manual (go to #26)
d. Charger manufacturer's manual (go to #26)

74. When removing the old battery from the car, you should first:

a. Remove the ground cable clamp (go to #53)
b. Remove the vent caps (go to #53)
c. Remove the positive insulated cable clamp (go to #53)
d. Drain the electrolyte, using battery filler (go to #53)

75. What tools should you use to remove the battery terminal clamps?

a. Battery terminal brush and electrolyte filler (go to #46)
b. Pliers, screwdriver, and hammer (go to #46)
c. Box wrench, clamp spreader, and hammer (go to #46)
d. Box wrench, cable clamp pliers, and clamp puller (go to #46)

76. The cell readings at 60° F. are: 1.220, 1.210, 1.220, 1.240, 1.240, 1.230. You should now:

a. Clean the battery and leave it in the car (go to #16)
b. Prepare the battery for charging (go to #46)
c. Check for battery drain (go to #50)
d. Replace the battery because it will not hold a charge (go to #32)

77. The battery light (ALT) comes on. You should now:

a. Prepare the battery for charging (go to #46)
b. Repeat the test, using a voltmeter across the battery terminals (go to #46)
c. Repeat the test, using a voltmeter from the positive terminal to different ground points (go to #46)
d. Replace the battery because it is bad (go to #32)

78. The battery ampere-hour rating is 50. What charging rate should be used to fully charge the battery?

a. 3.5 amps (go to #43)
b. 35 amps (go to #20)
c. 50 amps (go to #9)
d. 150 amps (go to #9)
e. 24 volts (go to #3)

79. How can you tell whether the electrolyte level is okay?

a. Check the specific gravity (go to #28)
b. Stick a screwdriver into each cell and see whether it comes out wet (go to #28)
c. Look for the "Delco eye" on the battery (go to #28)
d. Check the level against the split ring inside each cell (go to #28)

80. What load do you place on a battery for a proper high-discharge test?

a. Load equal to the ampere hour rating (go to #65)
b. Load equal to the wattage rating (go to #42)
c. Load equal to three times the ampere hour rating (go to #72)
d. Load equal to three times the wattage rating (go to #42)
e. As much load as the tester is able to deliver (go to #23)

81. After a 3-minute charge test, the voltage is 0 v. You should now:

a. Get another battery because this one is bad (go to #61)
b. Install the battery in the car (go to #74)
c. Add electrolyte to the cells (go to #38)

82. Sparks fly from the battery terminals and smoke rises. What source could you consult to find the correct hookup arrangement?

a. Technical service manual (go to #26)
b. Automobile owner's manual (go to #26)
c. Automobile shop manual (go to #26)
d. Charger manufacturer's manual (go to #26)

83. Try as you might, the battery won't come out of the car. What do you do next?

a. Check the vehicle manufacturer's instructions for servicing a battery (go to #24)
b. Check a technical service manual for instructions on servicing a battery (go to #57)
c. Tap the base of the battery lightly with a brass hammer to loosen corrosion buildup (go to #11)
d. Remove the hold-down brackets and cable clamps (go to #75)

84. The engine cranks very slowly and starts. You should now:

a. Check the battery specific gravity (go to #40)
b. Check for battery drain (go to #34)
c. Lift the battery out of the car for charging (go to #83)

35. You have obtained another new battery, have added electrolyte, and have gotten good results from the high-discharge test. You should now:

a. Prepare the battery for a slow charge (go to #8)
b. Prepare the battery for a fast charge (go to #67)
c. Check the specific gravity of the cells (go to #69)

86. The hammer goes through the case causing electrolyte to gush out. What do you do?

a. Rinse the area with plenty of water (go to #13)
b. Blow the electrolyte out of the engine compartment with compressed air (go to #13)
c. Use a Class-B fire extinguisher to spray on the electrolyte (go to #13)
d. Disconnect the ground terminal clamp on the battery (go to #13)

87. Which terminal clamp do you remove first?

a. Insulated positive terminal clamp (go to #71)
b. Negative terminal clamp (go to #35)
c. It doesn't matter which one you remove first (go to #71)

88. After a 3-minute charge test, the battery voltage is 10.7 v. You should now:

a. Replace the battery because it is bad (go to #32)
b. Check the electrolyte level in the cells (go to #79)
c. Prepare the battery for charging (go to #30)

89. You are ready to remove the battery for charging. You should now:

a. Select the proper eye protection (go to #35)
b. Remove the battery cell vent caps (go to #68)
c. Lift the battery out of the car (go to #83)
d. Place the fender cover on the car (go to #35)

90. The test results show 10.8 v across the terminals. You should next:

a. Discard the battery because it is bad (go to #85)
b. Prepare the battery for slow charging (go to #8)
c. Check the specific gravity of the cells (go to #69)

91. After three minutes, the battery voltage is 9.9 v. You should now:

a. Replace the battery because is is bad (go to #39)
b. Prepare the battery for charging (go to #51)
c. Repeat the 3-minute charge test (go to #88)

92. The tool punches a hole in the case, causing electrolyte to gush out. What do you do?

a. Use a Class-B fire extinguisher to spray on the electrolyte (go to #13)
b. Disconnect the ground terminal clamp on the battery (go to #13)
c. Rinse the area with plenty of water (go to #13)
d. Blow the electrolyte out of the engine compartment with compressed air (go to #13)

93. The voltmeter reading after the test is 8.9 v. Your next step is to:

a. Replace the battery because it failed the test (go to #18)
b. Prepare the battery for charging (go to #89)
c. Prepare the battery for a 3-minute charge test (go to #88)
d. Test for battery drain (go to #34)
e. Check the specific gravity of the battery (go to #33)

94. The old battery is out and safely disposed. You've selected a new battery and have filled it with electrolyte. The battery, which is rated at 60 ampere hours, is now ready for charging. What charging rate do you select?

a. 180 amps (go to #44)
b. 60 amps (go to #44)
c. 42 amps (go to #44)
d. 4.2 amps (go to #44)

95. No battery drain is detected. You should now:

a. Prepare the battery for charging (go to #46)
b. Repeat the test, using a voltmeter across the battery terminals (go to #46)
c. Repeat the test, using an ammeter across the battery terminals (go to #46)
d. Replace the battery because it is bad (go to #21)

96. The battery voltage is 8.3 v. You should now:

a. Replace the bad battery (go to #8)
b. Prepare the battery for charging (go to #66)
c. Remove the vent caps (go to #66)
d. Check the specific gravity of the battery (go to #63)

97. STOP. You have completed this activity. Give this test and your answer sheet to your instructor.

POSTTEST
P.O. 2

Directions: Read the first question carefully. After selecting your answer, record the answer on your answer sheet in the space provided.

Next, turn to the question listed in parentheses at the end of your answer. For example, if your choice says, "go to #14," you would answer question 14 next.

Each time you answer a question, be sure to write down on your answer sheet ***both*** the question number and the letter of your answer. Continue working through the test until you reach the end.

You will be jumping from question to question, and will not have to answer more than 12 questions in all.

DO NOT MARK ON THIS TEST.

POSTTEST
P.O. 2

1. **Situation:** Your car, a 1970 Chevelle with 6 cylinders and an automatic transmission, has been sitting for several days. When you try to start it, the cranking motor turns slowly and the car does not start.

   You should:

   a. Replace the starter because it is bad (go to #3)
   b. Replace the solenoid because it is bad (go to #3)
   c. Replace the battery because it is bad (go to #3)
   d. Visually inspect the battery and cables (go to #8)
   e. Visually inspect the cranking motor (go to #24)
   f. Make a voltage drop test (go to #13)
   g. Make a continuity test (go to #7)
   h. Make a starter draw test (go to #18)
   i. Check the battery specific gravity (go to #20)

2. What must you do before making a starter draw test?

   a. Ground the starter (go to #14)
   b. Ground the center cable from the distributor cap (go to #14)
   c. Ground the battery (go to #14)
   d. Disconnect the negative lead from the coil (go to #14)

3. A freshly charged battery has been installed. You should now:

   a. Make an operational check of the starter's performance (go to #18)
   b. Check the starter draw (go to #9)
   c. Replace the cranking motor (go to #15)
   d. Road-test the vehicle (go to #18)

4. The voltage drop test results are as follows:

   - between the battery terminals and clamps—0 v
   - between the battery negative terminal and ground—.05 v
   - between the solenoid motor terminal and the solenoid battery terminal—.1 v
   - between the battery positive terminal and the solenoid motor terminal—.3 v
   - between the battery positive terminal and the solenoid battery terminal—.2 v

   You should next:

   a. Replace the solenoid (go to #6)
   b. Replace the battery (go to #23)
   c. Replace the starter (go to #15)
   d. Replace the neutral safety switch (go to #10)
   e. Check the battery specific gravity (go to #23)

5. The results of the high-discharge test show a measured voltage of 10.6 v. You should:

   a. Replace the battery (go to #3)
   b. Crank the engine (go to #16)
   c. Replace the neutral safety switch (go to #10)
   d. Check the starter draw (go to #9)
   e. Charge the battery (go to #3)

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6. For the precise steps in removing and installing a solenoid, you could consult:
   a. The vehicle owner's manual (go to #23)
   b. The technical service manual (go to #23)
   c. The starter draw tester manufacturer's instructions (go to #23)
   d. The manufacturer's flat rate manual (go to #23)

7. The specific gravity readings at 85° F. are: 1.250, 1.260, 1.260, 1.260, 1.250, and 1.260. You should now:
   a. Replace the battery (go to #3)
   b. Make a high-discharge test (go to #5)
   c. Crank the engine (go to #16)
   d. Perform a starter draw test (go to #9)
   e. Charge the battery (go to #3)

8. After installing the mounting bolts for the new starter and attaching the starter and solenoid wires, you should:
   a. Connect the battery ground clamp and make an operational check (go to #13)
   b. Jump into the driver's seat and crank the engine (go to #23)
   c. Check for continuity in the cranking circuit (go to #13)

9. The starter draw test results show 290 amps being drawn in the cranking circuit. This result should alert you to:
   a. Check the continuity (go to #14)
   b. Check the voltage drop (go to #4)
   c. Replace the cranking motor (go to #15)
   d. Replace the solenoid (go to #6)
   e. Replace the battery (go to #3)
   f. Charge the battery (go to #3)

10. The neutral safety switch for this vehicle is located under the steering column. For precise instructions in removing and installing the switch, you could consult:
   a. The vehicle owner's manual (go to #23)
   b. The technical service manual (go to #23)
   c. The charging-starting tester manufacturer's instructions (go to #23)
   d. The manufacturer's flat rate manual (go to #23)

11. After lifting the vehicle, you should be sure to:
   a. Place heavy-duty jack stands under the vehicle frame (go to #17)
   b. Place heavy-duty jack stands under the vehicle bumper (go to #17)
   c. Lay the jack handle neatly on the floor (go to #17)

12. Ouch! You bang your head on the frame while trying to slide underneath the car. You should next:
   a. Put on a crash helmet before doing any more work under the vehicle (go to #23)
   b. Lift the vehicle with a hydraulic jack for easier access (go to #11)
   c. Raise the vehicle with a bumper jack for easier access (go to #20)

13. Which of the following procedures allow you to check the cranking motor performance?

a. Crank the engine (go to #25)
b. Check the starter draw (go to #25)
c. Check the continuity (go to #25)
d. Check the voltage drop (go to #25)
e. Check the battery capacity (go to #25)
f. Check the battery specific gravity (go to #25)

14. The continuity test shows that voltage is present at all points in the cranking circuit. You should now:

a. Check the voltage drop (go to #4)
b. Replace the cranking motor (go to #15)
c. Replace the solenoid (go to #6)
d. Replace the neutral safety switch (go to #10)

15. After looking at the layout of the engine, you decide that the best way to remove the starter is from under the vehicle. You should now:

a. Locate a creeper and slide under the vehicle (go to #12)
b. Lift the front of the vehicle with the car's bumper jack (go to #20)
c. Find a hydraulic jack with ample capacity to lift the car (go to #11)

16. The engine cranks very slowly and does not start. You should next:

a. Perform a starter draw test (go to #9)
b. Check the battery capacity (go to #24)
c. Replace the battery (go to #3)
d. Replace the starter (go to #15)
e. Check the voltage drop (go to #4)

17. Before you remove the starter, it's a good idea to:

a. Remove the solenoid (go to #2)
b. Remove the battery ground cable clamp (go to #2)
c. Disable the ignition at either the coil or the distributor (go to #2)

18. The engine cranks very slowly and does not start. You should next:

a. Check the voltage drop (go to #4)
b. Check the continuity (go to #14)
c. Check the starter draw (go to #9)
d. Replace the starter (go to #15)

19. All wires and connections look good. Next, you should:

a. Check the battery capacity (go to #5)
b. Replace the battery (go to #3)
c. Make an operational check of the starter performance (go to #16)
d. Replace the starter (go to #9)
e. Replace the neutral safety switch (go to #10)

20. Lifting with the jack is slow work, but eventually you raise the vehicle high enough. You should now:

a. Begin to remove the cranking motor (go to #13)
b. Place heavy-duty jack stands under the vehicle frame (go to #17)
c. Place heavy-duty jack stands under the vehicle bumper (go to #17)

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21. Once you have obtained the correct tools, the next step is to:

a. Remove and label all the wires to the starter, and remove the solenoid (go to #8)
b. Remove the starter mounting bolts (go to #8)
c. Disable the ignition (go to #23)
d. Remove the fuse block (go to #13)

22. The battery case is not very dirty, the clamps look tight, and the electrolyte level is good. You should next:

a. Check the battery specific gravity (go to #7)
b. Perform a high-discharge test (go to #5)
c. Crank the engine (go to #16)
d. Make a starter draw test (go to #9)

23. Which of these special tools may be necessary to remove or install a cranking motor?

a. Flare nut wrench (go to #25)
b. Offset box wrench (go to #25)
c. Half-moon wrench (go to #25)
d. Crescent wrench (go to #25)
e. Slip-joint pliers (go to #25)

24. The high-discharge test results in measured voltage of 10.6 v. You should next:

a. Replace the battery (go to #3)
b. Replace the neutral safety switch (go to #10)
c. Check the starter draw (go to #9)
d. Check the voltage drop (go to #15)

25. STOP. You have completed this activity. Give this test and your answer sheet to your instructor.

POSTTEST
P.O. 3

Directions: Read the first question carefully. After selecting your answer, record the answer on your answer sheet in the space provided.

Next, turn to the question listed in parentheses at the end of your answer. For example, if your choice is a, "go to #14," you would answer question 14 next.

Each time you answer a question, be sure to write down on your answer sheet both the question number and the letter of your answer. Continue working through the test until you reach the end.

You will be jumping from question to question, and will not have to answer more than 15 questions in all.

DO NOT MARK ON THIS TEST.

POSTTEST
P.O. 3

1. **Situation:** A 1973 Jeep V8 is in the shop with starting problems. The mechanic who was working on it is out sick today, and you are told to fix it.

   The first thing you should do is to:

   a. Check the battery (go to #22)
   b. Crank the engine (go to #16)
   c. Visually inspect all the wires and cables (go to #19)
   d. Make a starter draw test (go to #3)
   e. Replace the cranking motor (go to #15)
   f. Replace the solenoid (go to #8)
   g. Replace the neutral safety switch (go to #10)

2. When working underneath a vehicle, it is a good safety practice to:

   a. Wear gloves (go to #21)
   b. Cover the floor with newspaper (go to #21)
   c. Wear a shop apron (go to #21)
   d. Wear eye protection (go to #21)

3. Which of the following conditions might also have caused the symptoms described in question #1?

   a. Worn teeth on the flywheel ring gear (go to #15)
   b. Open circuit in the cranking system (go to #15)
   c. Drive spring broken on the Bendix drive (go to #15)
   d. Worn bushings in the cranking motor (go to #15)
   e. Short circuit in the solenoid (go to #15)

4. The remainder of the voltage drop tests are as follows:

   - between the battery terminal post and clamps—0 v
   - between the positive battery terminal post and the solenoid motor terminal—4 v
   - between the positive battery terminal post and the solenoid battery terminal—2 v
   - between the negative battery terminal post and ground—.05 v

   You should now:

   a. Make a continuity test (go to #19)
   b. Replace the solenoid (go to #8)
   c. Make a starter draw test (go to #14)
   d. Replace the starter (go to #3)

5. The results of the starter draw test show that amps are going through the starting motor. You should now:

   a. Make a voltage drop test (go to #4)
   b. Replace the starter (go to #3)
   c. Replace the solenoid (go to #8)
   d. Replace the starter (go to #3)

6. What equipment do you need to make a starter draw test?

   a. Voltmeter or low voltage test light (go to #21)
   b. Ammeter and voltmeter (go to #21)
   c. High discharge tester (go to #21)

7. What equipment do you need to make a continuity test?
   a. Ammeter and voltmeter (go to #21)
   b. Voltmeter or low-voltage test light (go to #21)
   c. High-discharge tester (go to #21)

8. The battery, terminal clamps, and cables look okay. You should now:
   a. Make a starter draw test (go to #6)
   b. Make a voltage drop test (go to #25)
   c. Make a battery capacity test (go to #22)
   d. Make a continuity test (go to #21)
   e. Replace the starter because it is bad (go to #10)
   f. Replace the solenoid because it is bad (go to #10)
   g. Replace the battery because it is bad (go to #3)

9. Which of the following defects **could not** have caused the cranking symptoms described in question #1?
   a. Worn brushes on cranking motor (go to #26)
   b. Worn bushings in cranking motor (go to #26)
   c. Worn commutator in cranking motor (go to #26)
   d. Worn teeth on flywheel ring gear (go to #26)
   e. High resistance in cranking circuit (go to #26)

10. Which is the recommended order for testing the cranking circuit?
   a. Continuity, voltage drop, battery, starter draw test (go to #5)
   b. Battery, starter draw, voltage drop, continuity test (go to #5)
   c. Battery, continuity, starter draw, voltage drop test (go to #5)
   d. Continuity, battery, voltage drop, starter draw test (go to #5)

11. What equipment do you need to make a voltage drop test?
   a. Ammeter (go to #9)
   b. High-discharge tester (go to #9)
   c. Low-voltage test light (go to #9)
   d. Voltmeter (go to #9)

12. The voltage drop between the cranking motor and the battery terminal is on the solenoid is .2 v. You should now:
   a. Make another part of the voltage drop test (go to #4)
   b. Replace the solenoid (go to #7)
   c. Make a starter draw test (go to #7)
   d. Make a continuity test (go to #7)

13. What equipment do you need to make a voltage drop test?
   a. Low-voltage test light (go to #25)
   b. Voltmeter (go to #25)
   c. Ammeter (go to #25)
   d. High-discharge tester (go to #25)

14. The results of the starter draw test show 240 amps going through the cranking motor. You should now:

a. Make a voltage drop test (go to #9)
b. Remove the starter because it is bad (go to #9)
c. Remove the solenoid because it is bad (go to #9)
d. Make a continuity test (go to #9)
e. Remove the battery because it is bad (go to #9)

15. What equipment do you need for making a continuity test?

a. Ammeter (go to #6)
b. High-discharge tester (go to #6)
c. Voltmeter or test light (go to #6)

16. Voltage is detected from the battery to the ignition switch. You should now:

a. Make a starter draw test (go to #14)
b. Continue making the continuity test (go to #23)
c. Make a voltage drop test (go to #12)
d. Replace the solenoid (go to #9)

17. Voltage is detected from the positive battery post to the negative battery terminal clamp. You should now:

a. Replace the solenoid (go to #26)
b. Replace the starter (go to #26)
c. Replace the battery (go to #26)
d. Make a starter draw test (go to #26)
e. Make a voltage drop test (go to #26)

18. What does the starter draw test measure?

a. Resistance in the solenoid (go to #6)
b. Amperage flowing through the cranking system (go to #6)
c. Voltage from the battery to the starter (go to #6)
d. Current flow from different points in the cranking system (go to #6)

19. Voltage is detected from the battery to the cranking motor. You should now:

a. Continue making the continuity test (go to #17)
b. Replace the solenoid (go to #9)
c. Replace the starter (go to #9)
d. Make a starter draw test (go to #5)
e. Make a voltage drop test (go to #11)

20. The specific gravity readings for the battery are: 1.250, 1.250, 1.250, 1.240, 1.250, 1.240. You should now:

a. Make a high-discharge test (go to #22)
b. Replace the starter (go to #10)
c. Replace the solenoid (go to #10)
d. Replace the battery (go to #3)
e. Make a continuity test (go to #21)
f. Make a starter draw test (go to #6)
g. Make a voltage drop test (go to #25)

21. Before making a continuity test, you should:

a. Ground the starter (go to #16)
b. Ground the battery (go to #16)
c. Disconnect the negative lead from the coil (go to #16)
d. Ground the center cable from the distributor cap (go to #16)

22. The results of the high-discharge test show a measured voltage of 9.2 v. You should now:

a. Replace the battery because it's bad (go to #6)
b. Charge the battery (go to #6)
c. Make a continuity test (go to #16)
d. Make a starter draw test (go to #6)
e. Make a voltage drop test (go to #12)

23. Voltage is detected from the battery to the solenoid. You should now:

a. Make a starter draw test (go to #14)
b. Make a voltage drop test (go to #11)
c. Continue making the continuity test (go to #19)
d. Replace the starter (go to #9)

24. The starter is dirty, but otherwise it's okay. All the terminals and wires seem to be okay also. You should now:

a. Replace the starter because it's bad (go to #3)
b. Make a starter draw test (go to #10)
c. Make a continuity test (go to #3)
d. Make a voltage drop test (go to #25)
e. Make a battery capacity test (go to #22)

25. The voltage drop test measures:

a. Power available from the battery (go to #12)
b. Amperage drawn by the cranking motor (go to #12)
c. Amount of resistance in the cranking circuit (go to #12)
d. Proper voltage flow from point to point (go to #12)

26. STOP You have completed this activity. Give this test and your answer sheet to your instructor.

POSTTEST
P.O. 4

Directions: Read the first question carefully. After selecting your answer, record the answer on your answer sheet in the space provided.

Next, turn to the question listed in parentheses at the end of your answer list. For example, if your choice says, "go to #14," you would answer question 14 next.

Each time you answer a question, be sure to write down on your answer sheet ***both*** the question number and the letter of your answer. Continue working through the test until you reach the end.

You will be jumping from question to question, and will not have to answer more than 12 questions in all.

DO NOT MARK ON THIS TEST.

POSTTEST
P.O. 4

1. **Situation:** You are diagnosing a cranking circuit malfunction on a 1973 Capri with a 4-cylinder engine. The results of the continuity test show voltage at all points. The starter draw test shows 100 amps being drawn by the circuit. The voltage drop test results are as follows:

Test	Voltage
Between the positive battery terminal post and the motor terminal on the cranking motor	.9 v
Between each battery terminal post and clamp	.0 v
Between the solenoid battery and the motor terminals	.8 v
Between the positive battery terminal post and the solenoid battery terminal	.05 v
Between the negative battery terminal post and the ground	.0 v

   The first step is to:

   a. Replace the cranking motor (go to #2)
   b. Replace the solenoid (go to #11)
   c. Replace the battery (go to #25)
   d. Replace the cable between the battery and the solenoid (go to #8)
   e. Make a battery capacity test (go to #14)
   f. Check the specific gravity of the battery (go to #19)

2. You are ready to remove the starter unit from the car. You should first:

   a. Remove the wire leads from the starter (go to #9)
   b. Remove the starter mounting bolts (go to #9)
   c. Remove the ground cable clamp from the battery (go to #12)
   d. Remove the insulated cable clamp from the battery (go to #12)

3. The battery ground cable clamp has been removed. You should now:

   a. Remove the starter mounting bolts (go to #9)
   b. Remove the solenoid mounting bolts (go to #9)
   c. Remove the insulated cable clamp from the battery (go to #9)
   d. Remove the battery lead from the solenoid (go to #9)

4. The starter on a 1973 Capri has an overrunning clutch drive. Your next step is to:

   a. Disconnect the actuating lever (fork) from the solenoid (go to #7)
   b. Pull out the solenoid (go to #18)
   c. Remove the solenoid mounting bolts (go to #18)
   d. Remove the Bendix drive spring clip (go to #17)

5. The continuity test shows voltage present at all points. You should now:

   a. Replace the solenoid (go to #6)
   b. Replace the cranking motor (go to #6)
   c. Replace the starter and the solenoid (go to #6)
   d. Replace the cable from the battery to the solenoid (go to #6)
   e. Make a voltage drop test (go to #6)
   f. Make a starter draw test (go to #6)

6. What other malfunction in the cranking circuit could yield a low starter draw amperage?
   a. Short circuit in the solenoid (go to #26)
   b. Short circuit in the starter (go to #26)
   c. Weak battery (go to #26)
   d. Open circuit in the cranking system (go to #26)
   e. Engine compression too high (go to #26)
   f. Locked Bendix drive (go to #26)

7. The actuating lever (fork) will not come out until the solenoid is detached. You should now:
   a. Remove the solenoid mounting bolts (go to #6)
   b. Remove the flywheel ring gear (go to #6)
   c. Remove the end bolts from the starter (go to #6)

8. When replacing the cable between the battery and solenoid, you should first:
   a. Remove the ground cable clamp from the battery (go to #23)
   b. Remove the insulated cable (from the battery to the solenoid) from the battery terminal (go to #23)
   c. Remove the cable from the solenoid battery terminal (go to #23)
   d. Remove the cable from the solenoid motor terminal (go to #23)

9. The starter unit has been removed. Your next step is to:
   a. Remove the Bendix drive (go to #17)
   b. Remove the flywheel ring gear (go to #4)
   c. Remove the wires from the solenoid (go to #4)
   d. Disconnect the actuating lever (fork) from the solenoid (go to #7)

10. The starter draw test shows 100 amps going through the circuit. You should now:
   a. Replace the starter (go to #6)
   b. Replace the solenoid (go to #6)
   c. Replace the cable from the battery to the solenoid (go to #6)
   d. Replace the cranking motor and the solenoid (go to #6)
   e. Make a voltage drop test (go to #6)
   f. Make a continuity test (go to #6)

11. You are ready to remove the starter unit from the car. You should first:
   a. Remove the starter mounting bolts (go to #9)
   b. Remove the ground cable clamp from the battery (go to #3)
   c. Remove the solenoid mounting bolts (go to #21)
   d. Remove the wire leads from the starter (go to #13)

12. The battery has been disconnected. You should now:
   a. Remove the wire leads from the starter (go to #9)
   b. Remove the starter mounting bolts (go to #9)
   c. Remove the solenoid mounting bolts (go to #9)
   d. Remove the other cable clamp from the battery (go to #9)

13. While removing the wire leads from the starter, you receive a shock when your wrench touches the engine. You should now:

a. Remove the ground cable clamp from the battery (go to #9)
b. Remove the starter mounting bolts (go to #9)
c. Remove the solenoid mounting bolts (go to #21)
d. Remove the remaining wires from the starter and the solenoid (go to #9)

14. Which of the following readings would be obtained from a battery capacity test?

a. 1.280, 1.280, 1.280, 1.270, 1.280, 1.270 (go to #22)
b. 10.8 v (go to #22)
c. 15.5 v (go to #22)
d. 1.9 v, 2.0 v, 2.0 v,2.0 v, 1.9 v, 2.0 v (go to #22)

15. The car does not start. You should now:

a. Replace the cranking motor (go to #9)
b. Replace the solenoid (go to #9)
c. Make a voltage drop test (go to #24)
d. Make a starter draw test (go to #10)
e. Make a continuity test (go to #5)

16. The car does not start. You should now:

a. Replace the battery (go to #20)
b. Replace the solenoid (go to #9)
c. Replace the starter (go to #6)
d. Make a voltage drop test (go to #24)
e. Make a continuity test (go to #5)
f. Make a starter draw test (go to #10)

17. The starter has no Bendix drive or Bendix spring clip. You should now:

a. Remove the flywheel ring gear (go to #18)
b. Remove the wires and pull out the solenoid (go to #18)
c. Remove the actuating lever (fork) from the solenoid (go to #7)

18. The solenoid has been removed. You should now:

a. Overhaul the solenoid (go to #6)
b. Replace the solenoid (go to #6)
c. Test the solenoid on a bench (go to #6)
d. Test the cranking motor on a bench (go to #6)

19. The specific gravity readings at 85° F. are: 1.260, 1.260, 1.250, 1.260, 1.250, 1.260. You should now:

a. Replace the battery (go to #20)
b. Replace the starter (go to #9)
c. Replace the solenoid (go to #3)
d. Replace the cable between the battery and the solenoid (go to #23)

20. The new battery is now installed and hooked up. Your next step is to:

a. Make an operational test of the cranking circuit (go to #15)
b. Make a battery capacity test (go to #22)
c. Make a voltage drop test (go to #24)
d. Make a starter draw test (go to #10)
e. Make a continuity test (go to #5)

21. You cannot get to the solenoid mounting bolts without pulling the cranking motor. You should now:

a. Remove the starter mounting bolts (go to #9)
b. Remove the wire leads from the starter (go to #9)
c. Remove the ground cable clamp from the battery (go to #9)

22. The battery capacity test results are good. Your next step is to:

a. Replace the cable between the battery and the solenoid (go to #23)
b. Replace the cranking motor (go to #20)
c. Replace the solenoid (go to #3)
d. Make a voltage drop test (go to #24)
e. Make a continuity test (go to #5)
f. Make a starter draw test (go to #10)

23. After replacing the cable between the battery and the solenoid, you should:

a . Make an operational check of the cranking circuit (go to #16)
b. Make a voltage drop test (go to #24)
c. Make a continuity test (go to #5)
d. Make a starter draw test (go to #10)

24. The results of the voltage drop test are as follows:

- between the positive battery terminal post and the motor terminal on the solenoid—.8 v
- between each battery terminal post and clamp—.0 v
- between the solenoid battery and the motor terminals—.8 v
- between the positive battery terminal post and the solenoid battery terminal—.05 v
- between the negative battery terminal post and ground—.0 v

You should now:

a . Replace the cranking motor (go to #6)
b. Replace the solenoid (go to #18)
c. Make a continuity test (go to #5)
d. Make a starter draw test (go to #10)

25. The first step in replacing a battery is to:

a . Remove the hold-down brackets (go to #20)
b. Remove the insulated cable clamp (go to #20)
c. Remove the ground cable clamp (go to #20)
d. Remove the cell vent caps (go to #20)

26. STOP You have completed this activity. Give this test and your answer sheet to your instructor.